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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,647	09/28/2001	Alfred I-Tsung Pan	10010865-1	1928

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HEWLETT-PACKARD COMPANY  
Intellectual Property Administration  
P.O. Box 272400  
Fort Collins, CO 80527-2400

EXAMINER

WILLS, MONIQUE M

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

09/964,647

Applicant(s)

PAN ET AL.

Examiner

Wills M Monique

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement(s) filed September 28, 2001 and July 28, 2003 has/have been received and complies with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 .

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1,4,7,10 and 13-14 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for employing specific fuel additives such as : hemoglobin, surfactants, oxygen scavengers and chelating agents, does not reasonably provide enablement for generic fuel additives to reduce co poisoning to the catalyst (claim 1) or increase wettability of the electrode (claim 4), reduce dissolved oxygen in the fuel (claim 7) or removing metal ions that are detrimental to the catalyst (claim 10) or improving fuel cell performance. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. The general fuel additives necessitated by the independent claims are broader than the enabling

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disclosure. The specification does not enable such broad limitations and it is beyond routine experimentation to determine which additive works to improve the above fuel cell conditions and which do not.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "liquid-type" is of uncertain meaning, rendering the term vague and indefinite. The word "type", when appended to an otherwise definite term, may render said term indefinite. *Ex parte Attig* ("zeolite-type") 7 USPQ 2d 1092 (BPAI 1988); *ex parte Copenhaver* 109 USPQ 118 (PO BdPatApp 1955).

The examiner acknowledges that applicant may be his/her own lexicographer however, the specification does not clearly define what a "liquid-type" fuel cell is. Reference is made to fuel cells using liquid fuel (page 1, lines 13-14) so it will be inferred that "liquid-type" fuel cells are cells that employ liquid fuel. However, this distinction is repugnant to terms in the art. Fuel cells are categorized according to the type of electrolyte (e.g., solid oxide, molten carbonate, alkaline, phosphoric acid, or solid

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polymer) used to accommodate ion transfer during operation. See Vitale U.S. Patent 5,981,098, column 1, lines 25-55. Further, when considering the liquid-type fuel cell definition of the instant disclosure, **all** fuel cells are liquid-type fuel cells because they are equipped to employ liquid or gaseous fuel with minor modifications. Applicant's disclosure bridging pages 2 and 3, exemplifies the type of minor modifications involved in converting fuel cell constituents to be more suitable in liquid fuel environments (i.e. coating gas diffusion electrode structures).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2 & 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Heller U.S. Patent 6,294,281.

Heller teaches a biological fuel cell comprising biological fluid such as blood, sap and other biological fluids or solids as the fuel for the bio cell (col. 3, lines 1-7). The fuel may include oxygen complexed with a biomolecule such as hemoglobin (col. 3, lines 10-

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15). The fuel cell also contains catalytic enzymes (col. 3, lines 40-50). The hemoglobin inherently reduces CO poisoning to the catalyst.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4-6 & 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Berlowitz et al. U.S. Pub. 20010038934.

Berlowitz teaches a fuel cell system using emulsified fuel wherein water is added to the fuel to decrease the amount of CO to the catalyst (par. 8-9). The polymer electrolyte membrane fuel cell or phosphoric acid fuel cells (par. 8) may be supplied liquid fuel through a pump/delivery system (par. 12). Each of said fuel cells inherently contains electrodes in order to generate electricity. The fuel also contains a surfactant (par. 17). The surfactant concentration is preferably less than 0.5wt% of the total

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emulsion weight (par. 17). The surfactant inherently increases the wettability of the electrode.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 4-14 are rejected under 35 U.S.C. 102(e) as being anticipated by  
Wagaman et al. U.S. Patent 6,331,220.

Wagaman teaches a gas-generating liquid composition for using as oxygen generators in fuel cells (col. 3, lines 50-55). The fuel may include minor additional components, such as a surfactant, oxygen scavenger and chelating agent (col. 7, lines 10-45). These additives usually total less than 1 percent by weight of the composition (col. 7, lines 10-20). An oxygen scavenger, such as ammonium thiosulfate, may be added to slow chemical degradation of the gas-generating liquid (col. 7, lines 23-26). The oxygen scavenger inherently reduces dissolved oxygen in the fuel. Another additive which may be used is a chelating agent, such as

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ethylenediamine tetraacetic acid (EDTA) or cyclohexanediaminetetraacetic acid (CDTA) or sodium salts of these compounds. Chelating agents serve to bind impurity metal ions in the liquid, and can serve to slow degradation of the gas-generating liquid. See column 7, lines 25-35. Another additive which may be used is a surfactant. Surfactants can serve to allow miscibility of the gas-generating liquid with certain fuels. Also, a surfactant can serve to modify the droplet size of the gas-generating liquid when it is sprayed, thus control the wettability of the electrode. See column 7, lines 43-48. In order to generate electricity, all fuel cells inherently include catalyst, fuel, electrodes, electrolytes and proton electrotransfer membranes. Therefore, the instant claims are anticipated by Wagaman.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heller U.S. Patent 6,294,281 as applied to claim 1 above.

Heller teaches a biological fuel cell comprising hemoglobin in the fuel, as described hereinabove.

The reference is silent to hemoglobin being present in the range of 0.001-1% by weight of the fuel.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the hemoglobin in said amounts, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. As taught by Heller in column 3, lines 10-20, the skilled artisan recognizes that the amount of hemoglobin directly effects the electrooxidation in the operation of the fuel cell.

### ***Conclusions***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (703) 305-0073. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

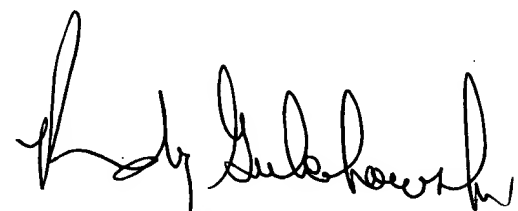
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Randy Gulakowski, may be reached at 703-308-4333.

The unofficial fax number is (703) 305-3599. The Official fax number for non-final amendments is 703-872-9310. The Official fax number for after final amendments is 703-872-9311.

Mw

8/31/03

A handwritten signature in black ink, appearing to read 'Randy Gulakowski', is written over a rectangular area.

RANDY GULAKOWSKI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700